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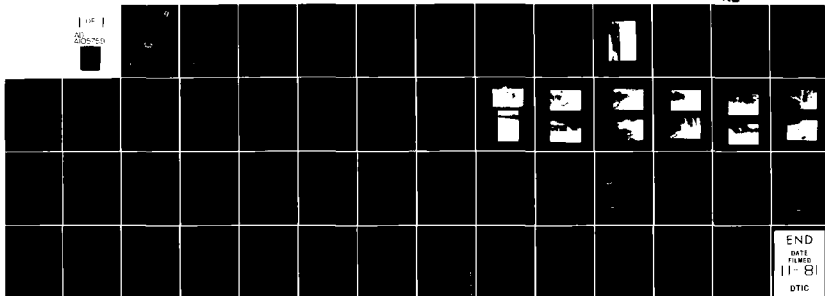
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NATIONAL DAM SAFETY PROGRAM. CONHOES RESERVOIR NUMBER 3 (INVENTO--ETC(U)
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MOHAWK RIVER BASIN

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COHOES RESERVOIR NO. 3

ALBANY COUNTY, NEW YORK

INVENTORY NO. N.Y. 1314

LEVEL II

PHASE I INSPECTION REPORT NATIONAL DAM SAFETY PROGRAM



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NEW YORK DISTRICT CORPS OF ENGINEERS

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization. The inspection of the Cohoes Reservoir No. 3 revealed several deficiencies on this structure which require further analysis and repair.		

The most serious deficiency noted was the erosion of the oversteepened inboard slopes, caused by wave action. Erosion was most severe on the southeastern corner of the impoundment. In several locations, up to three feet of soil had been removed from the crest. Other isolated areas of erosion were noted on the north and west slopes as well. Within 6 months of the notification of the owner, actions should be taken to flatten the upper portion of the inboard slopes and armor them against wave action.

Several other deficiencies were noted which were related to a drainage ditch near the toe of the north embankment's outboard slope. This ditch ran along the toe for about 50 feet starting at the eastern corner. It then bent away from the toe but about 100 feet from the north western corner, it turned back toward the embankment. The water flowed toward the embankment and disappeared in a hole about 10 feet from the toe. Further investigations should be commenced within 3 months to determine whether this has any adverse impact on the stability of the embankment. Remedial measures deemed necessary as a result of this investigation should be completed within 12 months.

Since this is a storage reservoir with both inflow and outflow controlled, the hydrologic/hydraulic analysis was not performed in the normal manner. Assuming a normal water level in the reservoir, the runoff resulting from the Probable Maximum Precipitation can safely be stored. Therefore, the spillway capacity is assessed as being adequate.

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PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
COHOES RESERVOIR NO. 3
I.D. No. NY-1314
#225-16 MOHAWK RIVER BASIN
ALBANY COUNTY, NEW YORK

TABLE OF CONTENTS

	<u>PAGE NO.</u>
- ASSESSMENT	-
- OVERVIEW PHOTOGRAPH	-
1 PROJECT INFORMATION	1
1.1 GENERAL	1
1.2 DESCRIPTION OF PROJECT	1
1.3 PERTINENT DATA	2
2 ENGINEERING DATA	4
2.1 GEOTECHNICAL DATA	4
2.2 DESIGN RECORDS	4
2.3 CONSTRUCTION RECORDS	4
2.4 OPERATIONAL RECORDS	4
2.5 EVALUATION OF DATA	4
3 VISUAL INSPECTION	5
3.1 FINDINGS	5
3.2 EVALUATION OF OBSERVATIONS	6
4 OPERATIONAL PROCEDURES	7
4.1 PROCEDURES	7
4.2 MAINTENANCE OF DAM	7
4.3 WARNING SYSTEM IN EFFECT	7
4.4 EVALUATION	7

		<u>PAGE NO.</u>
5	HYDROLOGIC/HYDRAULIC	8
5.1	DRAINAGE AREA CHARACTERISTICS	8
5.2	ANALYSIS CRITERIA	8
5.3	SPILLWAY CAPACITY	8
5.4	RESERVOIR CAPACITY	8
5.5	FLOODS OF RECORD	8
5.6	OVERTOPPING POTENTIAL	8
5.7	EVALUATION	8
6	STRUCTURAL STABILITY	9
6.1	EVALUATION OF STRUCTURAL STABILITY	9
7	ASSESSMENT/RECOMMENDATIONS	10
7.1	ASSESSMENT	10
7.2	RECOMMENDED MEASURES	10

APPENDIX

- A. PHOTOGRAPHS
- B. VISUAL INSPECTION CHECKLIST
- C. HYDROLOGIC/HYDRAULIC: ENGINEERING DATA AND COMPUTATIONS
- D. REFERENCES
- E. DRAWINGS

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam:	Cohoes Reservoir No. 3 I.D. No. NY-1314
State Located:	New York
County Located:	Albany
Watershed:	Mohawk River Basin
Dates of Inspection:	April 15, 1981 April 29, 1981

ASSESSMENT

The inspection of the Cohoes Reservoir No. 3 revealed several deficiencies on this structure which require further analysis and repair.

The most serious deficiency noted was the erosion of the oversteepened inboard slopes, caused by wave action. Erosion was most severe on the southeastern corner of the impoundment. In several locations, up to three feet of soil had been removed from the crest. Other isolated areas of erosion were noted on the north and west slopes as well. Within 6 months of the notification of the owner, actions should be taken to flatten the upper portion of the inboard slopes and to armor them against wave action.

Several other deficiencies were noted which were related to a drainage ditch near the toe of the north embankment's outboard slope. This ditch ran along the toe for about 50 feet starting at the eastern corner. It then bent away from the toe but about 100 feet from the north western corner, it turned back toward the embankment. The water flowed toward the embankment and disappeared in a hole about 10 feet from the toe. Further investigations should be commenced within 3 months to determine whether this has any adverse impact on the stability of the embankment. Remedial measures deemed necessary as a result of this investigation should be completed within 12 months.

Since this is a storage reservoir with both inflow and outflow controlled, the hydrologic/hydraulic analysis was not performed in the normal manner. Assuming a normal water level in the reservoir, the runoff resulting from the Probable Maximum Precipitation can safely be stored. Therefore, the spillway capacity is assessed as being adequate.

Several other deficiencies were noted on this structure and should be corrected within 12 months of the date of notification. Among the recommended actions are:

1. Eliminate the 50 foot segment of the drainage ditch which runs along the toe of the north embankment;
2. Attempt to drain the wet areas beyond the north and east slopes;
3. Cut all trees and brush on the embankment;
4. Regrade the irregularities on the crest;

5. Develop an emergency action plan for the notification and evacuation of downstream residents.

George Koch

George Koch
Chief, Dam Safety Section
New York State Department
of Environmental Conservation
NY License No. 45937

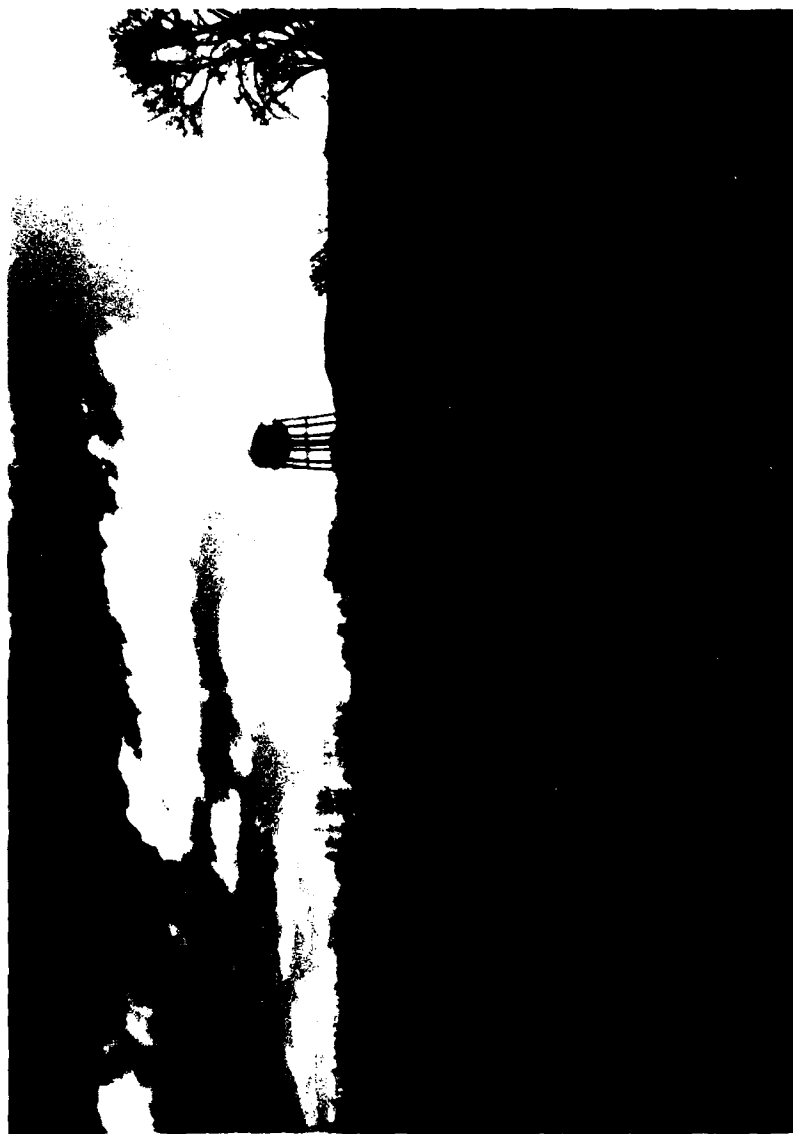
Approved By:

W.M. Smith, Jr.

Col. W.M. Smith, Jr.
New York District Engineer

Date:

21 JUL 1981



OVERVIEW
COHOES RESERVOIR NO. 3
I.D. NO. NY-1314

PHASE 1 INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
COHOES RESERVOIR NO. 3
I.D. No. NY-1314
225-16
MOHAWK RIVER BASIN
ALBANY COUNTY, NEW YORK

SECTION 1: PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase 1 inspection reported herein was authorized by the Department of the Army, New York District, Corps of Engineers, to fulfill the requirements of the National Dam Inspection Act, Public Law 92-367.

b. Purpose of Inspection

This inspection was conducted to evaluate the existing conditions of the dam, to identify deficiencies and hazardous conditions, to determine if these deficiencies constitute hazards to life and property, and to recommend remedial measures where required.

1.2 DESCRIPTION OF PROJECT

a. Description of dam

The Cohoes Reservoir No. 3 (Raw Water Reservoir) is a storage reservoir for untreated water within the City of Cohoes water supply system. An earth embankment extends completely around this reservoir. All inflow and outflow is through pipes.

The dam is formed by an embankment composed of clay. The total length of the embankment is 2800 feet. The maximum height of the embankment is about 20 feet. The outboard slopes of the embankment are 1 vertical on 2 horizontal. The lower portions of the inboard slopes are very flat. The slope on the upper 6 feet was much steeper. While this upper portion was somewhat variable, the slope was generally 1 vertical on 1 horizontal.

All flow into the reservoir is controlled by valves on one 24 inch and one 16 inch pipe. One of these pipes enters the reservoir near the gatehouse and the other enters at the bottom of the reservoir in the northwest quadrant. There are two pipes which can be used to withdraw water from the reservoir. The primary supply line is a 30 inch pipe through the east embankment. A vertical standpipe rises from this line and serves as a vent. A gatehouse built into the outboard slope of the east embankment contains the control mechanism for the gate valve which regulates flow in this pipe. Another 18 inch pipe through the east embankment can be used to discharge water if the 30 inch pipe becomes inoperable. The control mechanism for this pipe is also located in the gatehouse. Both of these supply pipes lead directly into the water treatment plant located just east of the reservoir.

There is also a pipe connected to one of the inflow lines which can be used to feed the treatment plant directly, completely bypassing the reservoir. There is a pipe through the south embankment which originally served as a bypass as well, but is now inoperable.

b. Location

This dam is located in the northwestern part of the City of Cohoes. It is immediately north of Vliet Boulevard.

c. Size Classification

The dam is 20 feet high and has a storage capacity of 230 acre-feet. Therefore, the dam is in the small size category as defined by the "Recommended Guidelines for Safety Inspection of Dams".

d. Hazard Classification

The dam is classified as high hazard due to the presence of a number of homes downstream of the south and east slopes of the embankment.

e. Ownership

This reservoir is owned by the City of Cohoes. It is under the jurisdiction of the Department of Public Works. The Commissioner of the Department of Public Works is Mr. Donald Senecal. The Department of Public Works' Office is located in City Hall, Cohoes, NY 12047. Mr. Senecal's phone number is (518) 237-7811.

The city engineer is Mr. Hugh T. McKee. His office is in City Hall and his phone number is (518) 237-7811.

f. Purpose of Dam

This dam is used as a water supply reservoir for the City of Cohoes. This reservoir is used for storage of untreated water before it goes through the treatment plant.

g. Design and Construction History

This dam was reportedly constructed around the year 1885. Modifications to the structure were made in 1900.

h. Normal Operating Procedures

Water is withdrawn from the reservoir as required by the City of Cohoes. Water is normally withdrawn by the 30 inch pipe through the east embankment. If this line becomes inoperable, two other pipes can be used to feed the treatment plant.

1.3 PERTINENT DATA

a. Drainage Area (acres) 13.8

b. Discharge at Dam (cfs)

Maximum Discharge * 15.5

Normal Discharge * 5.5

* Discharge limited by capacity of treatment plant. There is no spillway.

c. Elevation (USGS DATUM)

Top of Dam 310.

Invert of 8" Upper pipe 306.

d. Reservoir - Surface Area (acres)

Top of Dam 13.8

Normal Water Level 10.1

e. Storage Capacity (acre-feet)

Top of Dam 230.

Normal Water Level 168.

f. Embankment

Type: Compacted earth fill which completely surrounds reservoir; outboard slopes generally 1:V on 2:H; inboard slopes variable; upper 6 feet 1:V on 1:H or steeper. lower portion much flatter.

Dam Length (ft)	2800
Crest Width (ft)	
South Embankment	40
North Embankment	20
East and West Embankments	14

g. Inflow Pipes

Type: 16 inch and 24 inch pipes; one enters impoundment near gatehouse and the other enters in northwest quadrant of the reservoir itself.

h. Outflow Pipes

Type: 30 inch and 8 inch pipes through embankment; control mechanism for each pipe located in gatehouse cut into the slope.

i. Appurtenant Structures

Gatehouse - Cut into east embankment; 18 ft. by 18 ft. concrete building; Contains control mechanism for two discharge pipes and an inoperable pump for low level withdrawal.

SECTION 2: ENGINEERING DATA

2.1 GEOTECHNICAL DATA

a. Geology

The Cohoes Reservoir No. 3 Dam is located in the Hudson Valley lowlands physiographic province of New York State. This portion of the province, in the vicinity of the Mohawk, is a broad sandy plain resulting from glacial Lake Albany. The bedrock in this vicinity is from the Ordovician era (435 to 500 million years ago). The rock from this area consists of limestone, shale, and sandstone. A review of the "Brittle Structures Map of the State of New York" indicated that there are no faults in the immediate vicinity of the dam.

b. Subsurface Investigations

No records of any subsurface investigations performed in the vicinity of this structure could be located. An inspection report from 1928 indicates that the soil in the vicinity of the dam is predominantly clay.

2.2 DESIGN RECORDS

There were no design records available for this structure.

2.3 CONSTRUCTION RECORDS

No construction records were available. An inspection report from 1916 indicates that the dam was constructed in or about the year 1885. It was extensively repaired during the year 1900.

2.4 OPERATIONAL RECORDS

No operational records are maintained on this structure.

2.5 EVALUATION OF DATA

The data available for the preparation of this report was extremely limited. Information used was obtained from the Department of Environmental Conservation files and from measurements made at the time of the inspection.

SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspection of the Cohoes Reservoir No. 3 Dam was conducted on April 15, 1981. The weather was partly cloudy and the temperature was around 40 degrees. A follow-up inspection of the site was conducted on April 29, 1981.

b. Embankment

The embankment completely surrounds this reservoir. There were a number of deficiencies noted on this embankment.

The most serious of these problems was erosion on the inboard slope caused by wave action. The upper portions of the inboard slopes were very steep, which was another cause of the slope instability. The erosion was most severe on the south eastern corner of the impoundment. There was substantial erosion on both the south and east slopes. At the time of the inspection, there was discoloration of the water along the southern embankment from fine soil particles which had washed into the pool (see photos). Several other, isolated areas of erosion were noted on the north and west embankments as well. Broken concrete slabs had been placed for slope protection on portions of the north and east embankments but most of the slopes were unprotected. Trees and brush were growing on portions of each of the inboard slopes.

The crest of the embankment was grassed and in satisfactory condition. There were some minor irregularities at each edge of the crest. The erosion had caused these irregularities on the inboard slopes and burrow holes under the fence (which had been expanded by erosion) were the cause on the outboard slopes. There was also a depression in the crest on the south embankment along the line of the abandoned bypass pipe.

Several deficiencies were noted on the outboard slopes. There were a number of trees and some brush growing on these slopes. Several large stumps were observed on the southern embankment, which provided evidence of previous cutting. There were large trees growing on the north embankment. One large tree growing on the eastern embankment was impinging on the top of the fence along the crest. There were several areas at the toe of the west slope where it appeared that small excavations into the embankment had been made.

There were wet areas and/or streams beyond the toe of both the north and east embankments. There was a swampy area well beyond the toe of the eastern embankment. This area seemed to drain to the north and continued around the northeastern corner. A drainage ditch ran along the toe of the north slope for about 50 feet. The ditch then bent away from the toe but continued parallel to the embankment about 20 feet out from the toe. Another wet area located near the new large storage tank drained into this ditch. The ditch extended along most of the length of the embankment. At a point about 100 feet from the northwest corner of the embankment, the ditch again bent and water flowed toward the embankment. The water then disappeared into a hole about 10 feet from the toe of the embankment.

c. Inflow/Outflow Pipes

The pipes controlling flow into and out of the reservoir were submerged and, therefore, unobservable. The gatehouse located on the outboard slope of the east embankment contains the control mechanism for both the 30 inch

primary supply line and the 8 inch auxiliary line. The valve on the 30 inch line was reported to be operational, although it does not seal completely when closed. The valve on the 8 inch pipe was also reported to be operational. There was a pump in the gate house which would allow the withdrawal of water below the level of gravity feed, but this pump was not operational.

3.2 EVALUATION OF OBSERVATIONS

Visual observations revealed several deficiencies on this structure. The following items were noted:

1. Serious erosion on the inboard slope especially on the southeastern corner of the impoundment;
2. Irregularities in the crest caused by the erosion on the inboard slope and burrow holes under the fence on the outboard slope;
3. A drainage ditch running along the toe of the northern embankment which eventually bends in and flows into a hole about 10 feet from the toe of the embankment;
4. Wet areas beyond the toe on the northern and eastern outboard slopes;
5. Trees and brush growing on all sides of the embankment;
6. Two areas on the western outboard slope where there had been small excavations into the embankment;
7. Leakage through the 30 inch supply line when valve is completely closed.

SECTION 4: OPERATIONAL PROCEDURES

4.1 PROCEDURES

This reservoir is used as a storage facility by the City of Cohoes. The flow of all water into and out of the reservoir is regulated by valves on the inlet and outlet pipes. If the primary 30 inch outlet pipe becomes inoperable (plugged by ice, etc.), two other pipes can be used to feed the treatment plant, one of which completely bypasses the the reservoir. City personnel are on duty at the treatment plant at all times.

4.2 MAINTENANCE OF THE DAM

The dam is maintained by the owner. Mowing of the crest and other routine maintenance is performed on a regular basis.

4.3 WARNING SYSTEM IN EFFECT

There is no apparent warning system for notification and evacuation of downstream residents.

4.4 EVALUATION

The operation procedures on this structure are generally satisfactory. Some additional maintenance efforts are required to correct the deficiencies which exist on the structure.

SECTION 5: HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

This dam is a storage reservoir which is completely surrounded by embankment. Therefore, the structure's drainage area consists exclusively of the reservoir itself. The total drainage area for this dam is 13.8 acres.

5.2 ANALYSIS CRITERIA

Since the drainage area for this structure is the reservoir itself, inflow is limited to rain falling on the reservoir and flow through the 24 inch and 16 inch supply pipes. For this reason, no hydrologic analysis using the Corps of Engineers HEC-1 DB computer program was performed for this structure. Inflow and outflow can be controlled by valves on the pipes, so preventing overtopping simply involves proper operation.

5.3 SPILLWAY CAPACITY

The primary outflow capacity for this dam is provided by a 30 supply main which goes through the east side of the embankment. An 8 inch pipe through the east embankment is available should the main line become inoperable.

5.4 RESERVOIR CAPACITY

The normal storage capacity of this reservoir is approximately 168 acre-feet. Approximately 60 acre-feet of additional storage capacity is available between the normal pool and the top of the dam.

5.5 FLOODS OF RECORD

Since this is a storage reservoir with a drainage area equal to the surface and with almost complete control over the inflow and outflow, the concept of record flows is not applicable.

5.6 OVERTOPPING POTENTIAL

To determine overtopping potential, both inflow and outflow through the pipes was assumed to be zero. It was also assumed that the initial water level in the reservoir was at the level of the tee on the vent pipe (about 3 feet below the crest of the embankment). The volume of runoff produced by the Probable Maximum Precipitation of 21 inches (adjusted to account for the size of the drainage area) over the 13.8 acre drainage area would be approximately 24 acre-feet. This would raise the water level in the reservoir by about 2 feet.

5.7 EVALUATION

The limited hydrologic/hydraulic analysis performed for this structure indicates that the reservoir could safely store and discharge the runoff produced by the Probable Maximum Precipitation. Therefore, the spillway capacity is assessed as adequate according to the Corps of Engineer's screening criteria.

SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

Visual observation of the embankment revealed several deficiencies. The erosion of the inboard slopes, especially on the southeastern corner, was the most serious problem observed. The primary cause of this problem was wave action. The steep upper portions of the inboard slopes were another cause of this problem. The erosion had cut up to three feet into the crest in some areas.

There were wet areas beyond the toe of the outboard slopes on both the north and east sides. A drainage ditch ran parallel to the toe of the north slope for most of its length. The ditch turned toward the embankment and the water disappeared into a hole about 10 feet from the toe of the embankment.

b. Design and Construction Data

No design or construction information relating to the structural stability of this dam was available.

c. Seismic Stability

No seismic stability analysis was performed for this structure.

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

The Phase 1 inspection of Cohoes Reservoir No. 3 revealed that there were several deficiencies on this structure which should be corrected. The most serious deficiency noted was the erosion of the inboard slopes caused by wave action. In some areas, the erosion had cut up to three feet into the crest. There were wet areas beyond the toe of the outboard slopes on both the north and east sides. A drainage ditch which ran parallel to the toe of the slope carried water into a hole about 10 feet from the toe of the embankment.

b. Adequacy of Information

Information available for the preparation of this report was extremely limited. No plans or construction data was available.

c. Need for Additional Investigations

An investigation should be undertaken to determine why water disappears into a hole beyond the toe of the north embankment. The investigation should ascertain whether this condition has any adverse impact on the stability of the embankment.

d. Urgency

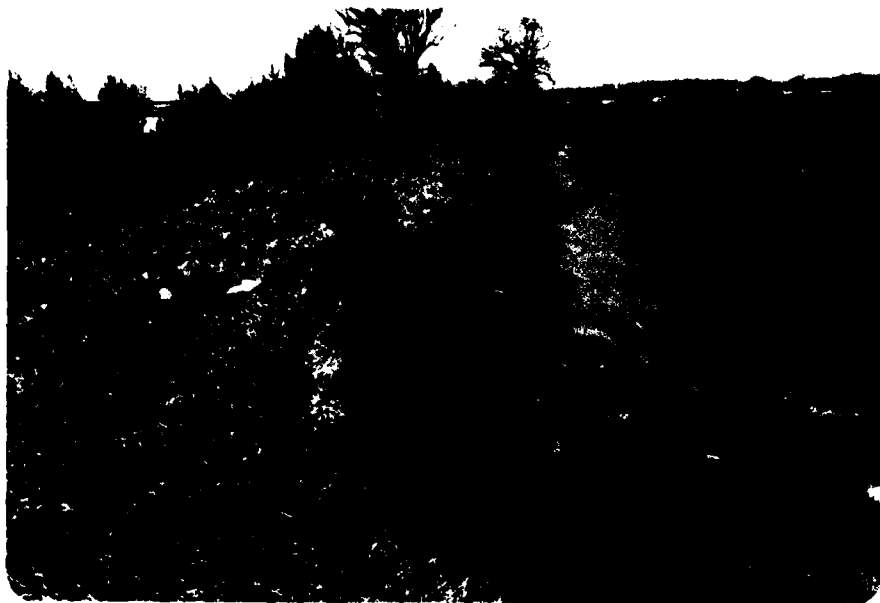
The investigation mentioned above should be commenced within three months of the date of the notification of the owner. Recommended measures outlined in the following section should be completed within 12 months.

7.2 RECOMMENDED MEASURES

- a. Flatten the upper portion of the inboard slopes and armor the slopes to protect against wave action.
- b. Take actions required based on the investigation into the water flowing into a hole near the toe of the embankment.
- c. Eliminate the segment of the drainage ditch at the eastern end of the north slope which ran along the toe for about 50 feet.
- d. Attempt to drain the wet areas which exist beyond the toe of the north and east slopes.
- e. Cut all trees and brush growing on all portions of the embankment.
- f. Regrade the irregularities on the crest caused by burrow holes under the fence.
- g. Regrade two areas near the toe of the western outboard slope where it appeared that excavations had been made.

APPENDIX A

PHOTOGRAPHS



Erosion of Southern Slope by Wave Action; Rule
Extension is 3 Feet.



Erosion of Southern Slope; Note
Discoloration of Water by Soil



Southern Outboard Slope; Note Trees
and Brush Growing on Slope



Crest of Southern Slope from Western End.



Crest of Western Slope; Note Brush on Inboard Slope



Excavated Area at Toe of Western Outboard Slope



Crest of Northern Embankment; Note
Trees on Outboard Slope



Drainage Ditch Running Near Toe of
Northern Slope; Note Trees on Slope



Southern End of Eastern Slope; Note Erosion Scars.



Northern End of Eastern Slope; Note Erosion Scars



Gatehouse Cut into Eastern Outboard Slope; Note Trees
on Slope



Inboard Slope at Northeast Corner; Note
Broken Slabs of Concrete for Slope Protection

APPENDIX B

VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST1) Basic Data

a. General

Name of Dam COHOES RESERVOIR No. 3
Fed. I.D. # NY 1314 DEC Dam No. 225-16
River Basin MOHAWK
Location: ^{CITY}~~Town~~ COHOES County ALBANY
Stream Name NONE
Tributary of N/A
Latitude (N) 42° 46.8' Longitude (W) 73° 43.4'
Type of Dam EARTH EMBANKMENT STORAGE RESERVOIR
Hazard Category C
Date(s) of Inspection 4/15/81
Weather Conditions 40°F SUNNY
Reservoir Level at Time of Inspection _____

b. Inspection Personnel R. WARRENDER W. LYNICK

c. Persons Contacted (Including Address & Phone No.) _____

HUGH T. MCKEE, CITY ENGINEER DON SENECA, COMM. OF PUBLIC WORKS
CITY OF COHOES CITY OF COHOES
COHOES, NEW YORK 12047
(518) 237-7811

d. History:

Date Constructed ABOUT 1885 Date(s) Reconstructed 1900
Designer UNKNOWN
Constructed By UNKNOWN
Owner CITY OF COHOES

2) General Embankment characteristics

a. Characteristics

- (1) Embankment Material CLAY & GLACIAL TILL FROM IMPOUNDMENT
- (2) Cutoff Type NONE
- (3) Impervious Core NONE
- (4) Internal Drainage System NONE
- (5) Miscellaneous _____

3) East Embankment

a. Crest

- (1) Vertical Alignment SATISFACTORY
- (2) Horizontal Alignment OKAY
- (3) Surface Cracks SOME CRACKS NEAR ERODED AREAS
- (4) Miscellaneous _____

b. Inboard Slope

- (1) Slope (Estimate) (V:H) 1:1 - VERY STEEP UPPER PORTION - FLATTENS
BELOW WATER LEVEL
- (2) Undesirable Growth or Debris, Animal Burrows SOME BRUSH & TREES ON EMBANKMENT
- (3) Sloughing, Subsidence or Depressions SERIOUS EROSION & SLOUGHING ON
BANK CAUSED BY WAVE ACTION

(4) Slope Protection NONE - THIS IS WHY EROSION IS SUCH A PROBLEM

c. Outboard Slope

(1) Slope (Estimate - V:H) 1 ON 2.5

(2) Undesirable Growth or Debris, Animal Burrows SOME TREES & BRUSH - ONE TREE HANGS OVER FENCE ON CREST & IS PUSHING IT DOWN

(3) Sloughing, Subsidence or Depressions SEVERAL BURROW HOLES UNDER FENCE WHICH HAVE BEEN EXPANDED SLIGHTLY BY EROSION

(4) Surface Cracks or Movement at Toe NONE

(5) Seepage NONE NOTED

(6) External Drainage System (Ditches, Trenches; Blanket) NONE

(7) Seepage Beyond Toe WET AREA NEAR NORTHERN END - WELL BEYOND TOE OF DAM - AREA QUITE SWAMPY

4) South Embankment

a. Crest

- (1) Vertical Alignment DEPRESSION ALONG LINE OF BYPASS PIPE CUTS DIAGONALLY ACROSS CREST
- (2) Horizontal Alignment SATISFACTORY
- (3) Surface Cracks SOME CRACKS NEAR ERODED AREAS
- (4) Miscellaneous _____

b. Inboard Slope

- (1) Slope (Estimate)(V:H) 1:1 VERY STEEP UPPER PORTION
- (2) Undesirable Growth or Debris, Animal Burrows SOME BRUSH ON WEST END
- (3) Sloughing, Subsidence or Depressions SERIOUS EROSION & SLOUGHING ON BANK CAUSED BY WAVE ACTION - UP TO 3' INTO BANK - WATER DISCOLORED BY SOIL PARTICLES FROM EROSION

c. Outboard Slope

- (1) Estimate -(V:H) 1 ON 2
- (2) Undesirable Growth or Debris SOME LIES & BRUSH - LARGE STUMPS PROVIDE EVIDENCE OF PRIOR CUTTING
- (3) Sloughing, Subsidence or Depressions NONE
- (4) Surface Cracks or Movement at Toe NONE
- (5) Seepage NONE
- (6) External Drainage System (Ditches, Trenches; Blanket) NONE
- (7) Seepage Beyond Toe NONE

5) West Embankment

a. Crest

(1) Vertical Alignment SATISFACTORY

(2) Horizontal Alignment SATISFACTORY

(3) Surface Cracks NONE

(4) Miscellaneous _____

b. Inboard Slope

(1) Slope (Estimate) (V:H) 1:1 - UPPER PORTION VERY STEEP

(2) Undesirable Growth or Debris SUBSTANTIAL AMOUNT OF BRUSH & TREES ON SLOPE

(3) Sloughing, Subsidence or Depressions SEVERAL AREAS OF EROSION DUE TO WAVE ACTION

c. Outboard Slope

(1) Estimate - (V:H) 1 ON 2

(2) Undesirable Growth or Debris SOME BRUSH & SMALL TREES GROWING ON SLOPES

(3) Sloughing, Subsidence or Depressions NONE - THERE WERE 2 AREAS WHERE IT APPEARED SOME SOIL HAD BEEN REMOVED FROM TOE

(4) Surface Cracks or Movement at Toe NONE

(5) Seepage NONE

(6) External Drainage System (Ditches, Trenches; Blanket) NONE

(7) Seepage Beyond Toe NONE

6. North Embankment

a. Crest

- (1) Vertical Alignment SOME DOG OUT AREAS UNDER FENCE ALONG CREST
- (2) Horizontal Alignment SATISFACTORY
- (3) Surface Cracks NONE
- (4) Miscellaneous _____

b. Inboard Slope

- (1) Slope (Estimate) (V:H) 1:1 VERY STEEP UPPER PORTION - FLATTENS BELOW WATER LEVEL
- (2) Undesirable Growth or Debris SOME BRUSH & TREES ON SLOPE
- (3) Sloughing, Subsidence or Depressions SOME AREAS OF EROSION CAUSED BY WAVE ACTION - CONCRETE SLABS IN SOME OF ERODED AREAS

c. Outboard Slope

- (1) Estimate - (V:H) 1:2
- (2) Undesirable Growth or Debris SUBSTANTIAL AMOUNT OF TREES & BRUSH
- (3) Sloughing, Subsidence or Depressions NONE
- (4) Surface Cracks or Movement at Toe NONE
- (5) Seepage NONE
- (6) External Drainage System (Ditches, Trenches; Blanket) DITCH RUNS ALONG TOE FOR 50' & THEN ABOUT 20' OUT FROM TOE - ABOUT 100' FROM END IT TAKES BEND INTO EMBANKMENT & DISAPPEARS INTO A HOLE.
- (7) ~~Seepage Beyond Toe~~ THERE ARE WET AREAS BEYOND THE TOE

7) Drainage Systema. Description of System NONE8) Instrumentation (Monumentation/Surveys, Observation Wells, Weirs,
Piezometers, Etc.) NONE9) Area Downstream of Dama. Downstream Hazard (No. of Homes, Highway, etc.) 10-20 HOMES BEYOND
TOE OF SOUTH EMBANKMENTb. Seepage, Unusual Growth SEVERAL WET AREAS BEYOND TOE OF
EAST & NORTH EMBANKMENTS - THESE WET AREAS SEEM TO
DRAIN INTO DITCHc. Evidence of Movement Beyond Toe of Dam NONE10) Spillway (s) Including Discharge Conveyance Channel)INFLOW & OUTFLOW CONTROLLED BY PIPESa. General THE VALVE ON 30" SUPPLY LINE REPORTEDLY
LEAKS WHEN COMPLETELY CLOSEDb. Condition of Service Spillway OUTFLOW PIPES GO THROUGH EMBANKMENT
MAIN SUPPLY LINE HAS OPERABLE GATE ; GATES ON TWO OTHER
SUPPLY LINES ALSO REPORTEDLY OPERATIONAL

10) Appurtenant Structures (Power House, Lock, Gatehouse, Other)

a. Description and Condition

GATE HOUSE - CUT INTO EMBANKMENT ON
~~WEST~~ EAST SIDE. 30" MAIN SUPPLY LINE
GOES THROUGH EMBANKMENT INTO GATEHOUSE
16" AUK. LINE ALSO GOES THROUGH. VALVES
IN GATEHOUSE ARE REPORTEDLY OPERATIONAL.
PUMP IN GATEHOUSE WHICH PERMITS FLOW
BELOW LEVEL OF GRAVITY FEED IS NOT OPERATIONAL.

12) Operation Procedures (Lake Level Regulation):

WATER WITHDRAWN AS REQUIRED BY
CITY OF CONGOES.

13) STRUCTURAL - NOT APPLICABLE ON THIS DAM

APPENDIX C
HYDROLOGIC/HYDRAULIC
ENGINEERING DATA AND COMPUTATIONS

COHOES RESERVOIR No. 3
NY - 1314

1

CHECK LIST FOR DAMS
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

AREA-CAPACITY DATA:

	(USGS) <u>Elevation</u> (ft.)	<u>Surface Area</u> (acres)	<u>Storage Capacity</u> (acre-ft.)
1) Top of Dam	<u>310</u>	<u>13.8</u>	<u>230</u>
2) Design High Water (Max. Design Pool)	<u>N/A</u>	<u> </u>	<u> </u>
3) Auxiliary Spillway Crest	<u>N/A</u>	<u> </u>	<u> </u>
4) NORMAL Pool Level ██████████	<u>306</u>	<u>10.1</u>	<u>168</u>
5) Service Spillway Crest	<u>N/A</u>	<u> </u>	<u> </u>

DISCHARGES - CONTROLLED BY WATER LINES TO
TREATMENT PLANT & WATER
DEMAND

	<u>Volume</u> (cfs)
1) ██████████ NORMAL DISCHARGE	<u>5.5</u>
2) Spillway @ Maximum High Water	<u> </u>
3) Spillway @ Design High Water	<u> </u>
4) Spillway @ Auxiliary Spillway Crest Elevation	<u> </u>
5) Low Level Outlet	<u> </u>
6) Total (of all facilities) @ Maximum High Water	<u> </u>
7) Maximum ██████████ DISCHARGE	<u>15.5</u>
8) At Time of Inspection	<u>N/A</u>

CREST:

ELEVATION: 310

Type: EARTH w/ GRASS COVER

Width: VARIES: 14' - 40' Length: 2800'

Spillover NONE

Location N/A

SPILLWAY:

SERVICE

AUXILIARY

N/A

Elevation NONE

Type

Width

Type of Control

Uncontrolled

Controlled:

Type
(Flashboards; gate)

Number

Size/Length

Invert Material

Anticipated Length
of operating service

Chute Length

Height Between Spillway Crest
& Approach Channel Invert
(Weir Flow)

HYDROMETEROLOGICAL GAGES:

Type : NONE

Location: _____

Records:

Date - _____

Max. Reading - _____

FLOOD WATER CONTROL SYSTEM:

Warning System: NONE

Method of Controlled Releases (mechanisms):

WATER LINES TO TREATMENT PLANT (30" ϕ & 8" ϕ PIPES)

DRAINAGE AREA: 13.8 ACRES 0.021 SQ MILES

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: RESERVOIR SURFACE - WATER

Terrain - Relief: FLAT

Surface - Soil: N/A

Runoff Potential (existing or planned extensive alterations to existing
(surface or subsurface conditions)

NO

Potential Sedimentation problem areas (natural or man-made; present or future)

N/A

Potential Backwater problem areas for levels at maximum storage capacity
including surcharge storage:

NO

Dikes - Floodwalls (overflow & non-overflow) - Low reaches along the
Reservoir perimeter:

Location: N/A

Elevation: _____

Reservoir:

Length @ Maximum Pool ± 800' ± 0.15 (Miles)

Length of Shoreline (Crest) ± 2750' ± 0.50 (Miles)

PROJECT GRID

JOB	CONOES RESERVOIR NO. 3	SHEET NO.	1	CHECKED BY		DATE	
SUBJECT	HYDROLOGIC / HYDRAULIC COMPUTATIONS			COMPUTED BY	RLW	DATE	4/27/81
<p>PLANIMETERED AREAS - 7.5 MIN USES TROY NORTH QUAD</p> <p>DAM CREST DRAINAGE AREA = .16 IN² = 13.77 ACRES</p> <p>RESERVOIR AREA ON QUAD = .11 IN² = 10.1 ACRES</p> <p>ACCORDING TO U.T. MCKEE - CITY ENGINEER FOR CONOES</p> <p>RESERVOIR CAPACITY = 75,000,000 GAL. = 230 AC·FT</p>							
<p>HMP = 19 INCHES OVER 13.8 AC DRAINAGE AREA = 22 AC·FT</p> <p>ADJUSTED TO ACCOUNT FOR SIZE OF DRAINAGE AREA</p> <p>(19 INCHES (111%)) = 21.09 IN OVER 13.8 AC = 24.2 AC·FT</p> <p>$\frac{24.2 \text{ AC·FT}}{13.8 \text{ AC}} = 1.76' \text{ RISE}$</p>							

APPENDIX D
REFERENCES

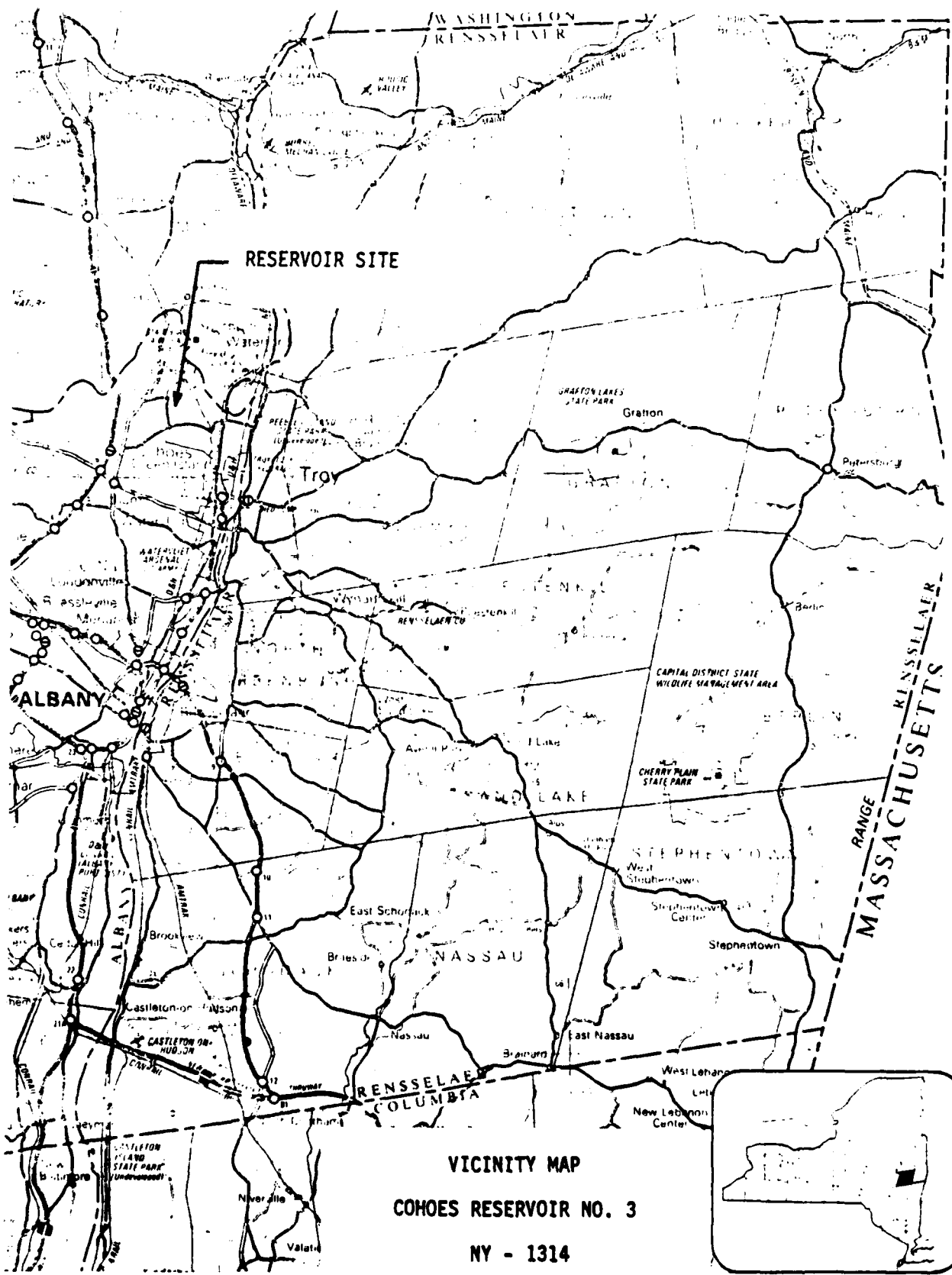
APPENDIX D

REFERENCES

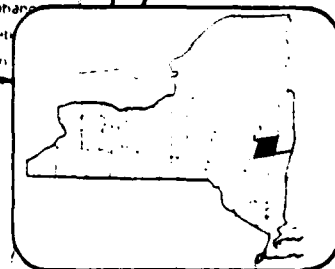
- 1) U.S. Department of Commerce; Weather Bureau;
Hydrometeorological Report No. 33 - Seasonal Variation of the Probable
Maximum Precipitation East of the 105th Meridian for Areas from 10 to
1,000 Square Miles and Durations of 6, 12, 24, and 48 Hours, April 1956.
- 2) H.W. King and E.F. Brater, Handbook of Hydraulics, 5th edition,
McGraw-Hill, 1963.
- 3) University of the State of New York, Geology of New York, Education
Leaflet 20, Reprinted 1973.
- 4) Elwyn E. Seelye, Design, 3rd edition, John Wiley and Sons, Inc., 1960.
- 5) U.S. Department of the Interior, Bureau of Reclamations;
Design of Small Dams, 2nd edition (rev. reprint), 1977.

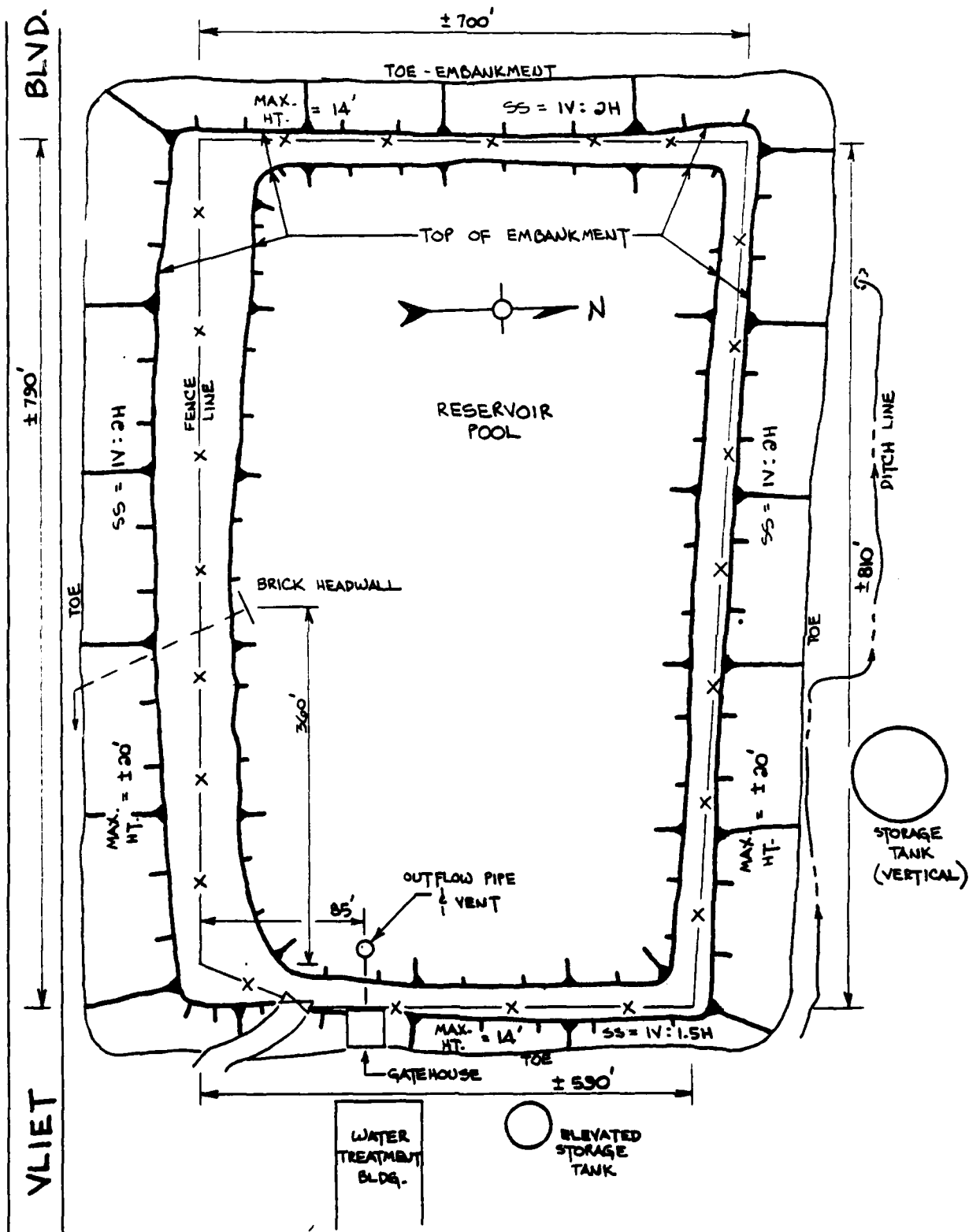
APPENDIX E

DRAWINGS



VICINITY MAP
COHOES RESERVOIR NO. 3
NY - 1314





COHOES RESERVOIR NO. 3
 NY - 1314
 (Field Measurements - April 1981)

NOTICE: After filling out one of these forms as completely as possible for each dam in your district, return it at once to the Conservation Commission, Albany.

STATE OF NEW YORK
CONSERVATION COMMISSION
ALBANY

DAM REPORT

225
16 mch.

6/8

1916
(Date)

CONSERVATION COMMISSION,

DIVISION OF INLAND WATERS.

GENTLEMEN:

I have the honor to make the following report in relation to the structure known as the No 3 Reservoir (Cohoes) Dam.

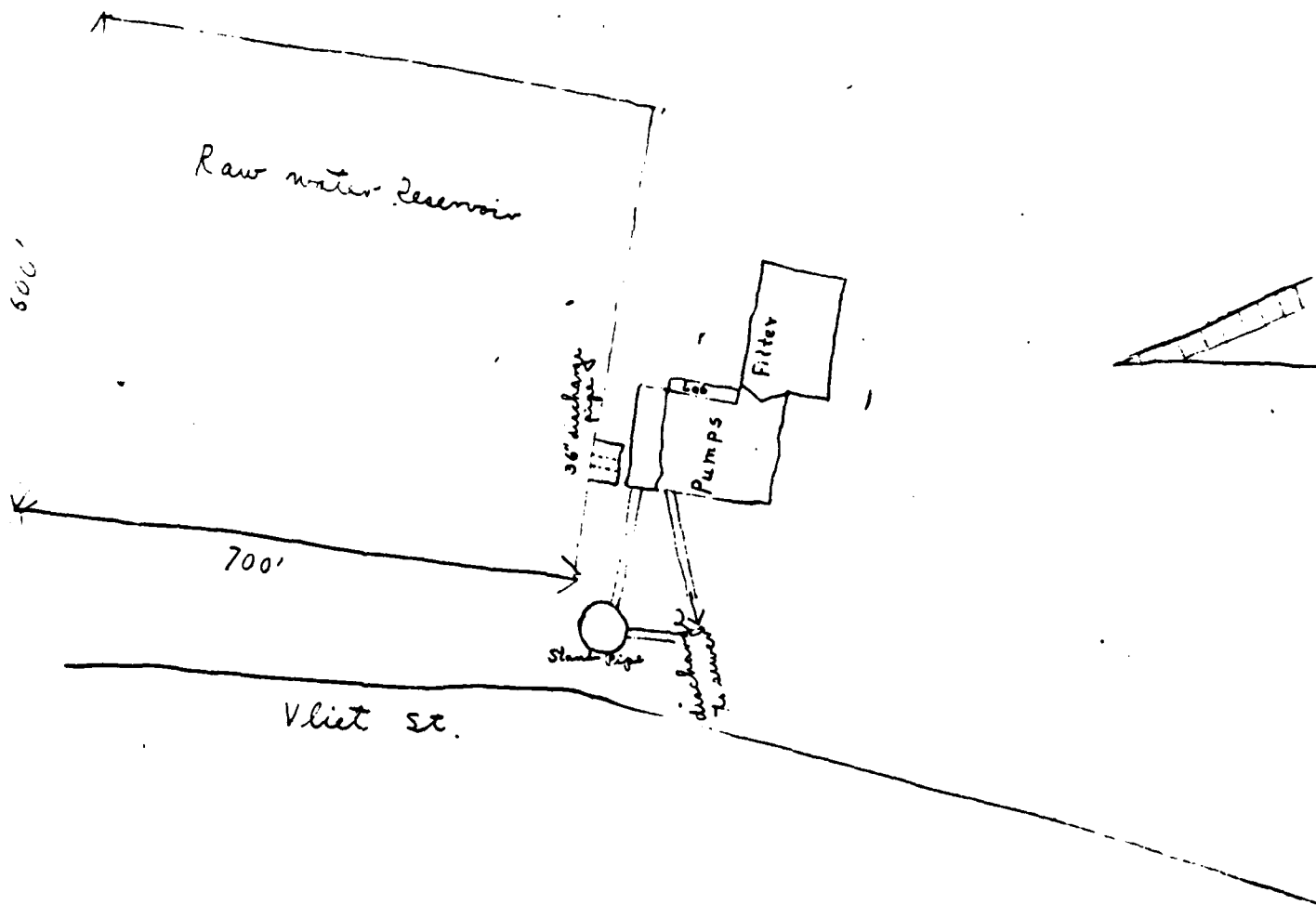
This dam is situated upon the _____
(Give name of stream)
in the Town of Cohoes, _____ County,
about _____
(State distance) from the Village or City of Cohoes.
The distance 100 ft stream from the dam, to the Vliet St,
(Up or down) (Give name of nearest important stream or of a bridge)
is about _____
(State distance)

The dam is now owned by City of Cohoes
(Give name and address in full)
and was built in or about the year 1885, and was extensively repaired or reconstructed during the year 1900.

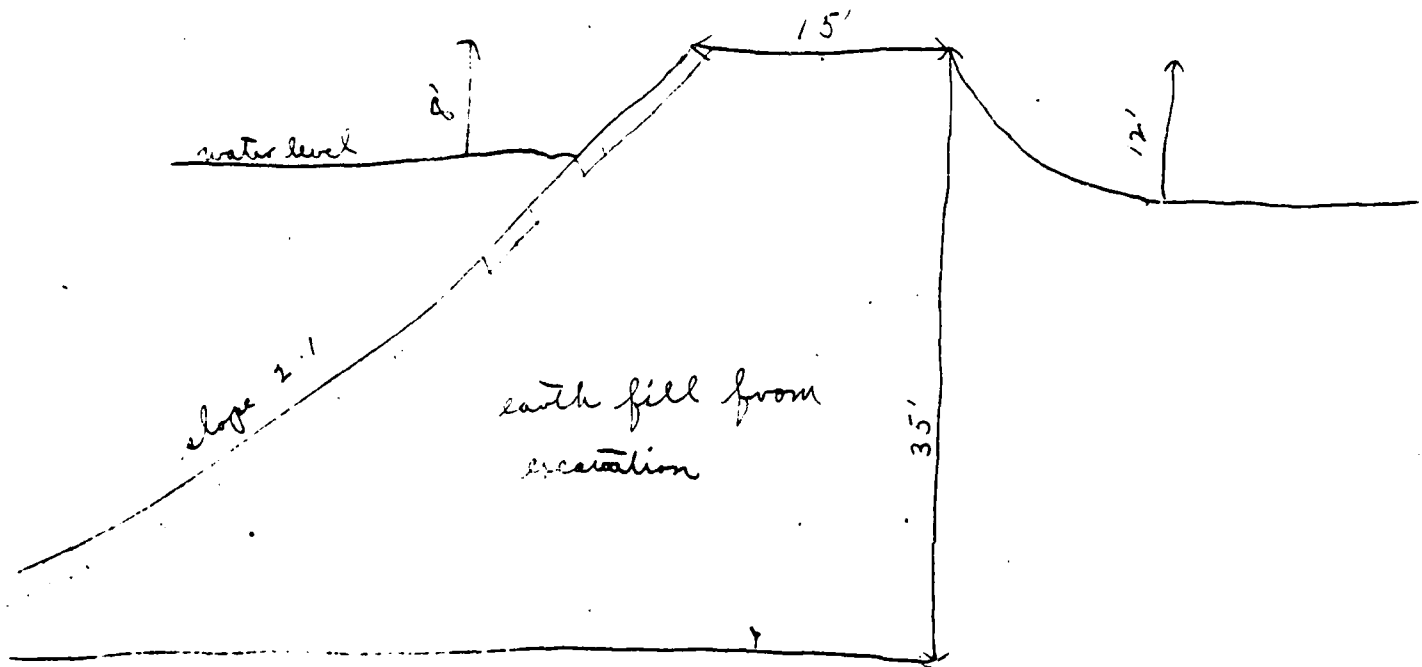
As it now stands, the spillway portion of this dam is built of _____
(State whether of masonry, concrete or timber)
and the other portions are built of earth fill in back with masonry
(State whether of masonry, concrete, earth or timber with or without rock fill)

As nearly as I can learn, the character of the foundation bed under the spillway portion of the dam is _____ and under the remaining portions such foundation bed is gravel.

(In the space below, make a third sketch showing the general plan of the dam, and its approximate position in relation to buildings or other conspicuous objects in the vicinity.)



In the space below, make one sketch showing the form and dimensions of a cross section through the spillway or waste-weir of the dam, and a second sketch showing the same information for a cross section through the other portion of the dam. Show particular the greatest height of the dam above the stream bed, its thickness at the top, and thickness at the bottom, as nearly as you can learn



The total length of this dam is.....feet. The spillway or waste-weir portion, is about.....feet long, and the crest of the spillway is about.....feet below the top of the dam.

The number, size and location of discharge pipes, waste pipes or gates which may be used for drawing off the water from behind the dam, are as follows:.....

.....
.....

At the time of this inspection the water level above the dam was.....ft.....in.
below the crest of the ~~spillway~~ *embankment*
~~above~~

(State briefly, in the space below, whether, in your judgment, this dam is in good condition, or bad condition, describing particularly any leaks or cracks which you may have observed.)

Reservoir in good condition

Reported by.....
(Signature)

.....
(Address—Street and number, P. O. Box or R. F. D. route)

.....
(Name of place)

STATE OF NEW YORK
DEPARTMENT OF
State Engineer and Surveyor
ALBANY

Report of a Structure Impounding Water

To assist in carrying out the provisions of Section 22 of the Conservation Law, being Chapter LXV of the Consolidated Laws of New York State, relating to safeguarding life and property and the erection, reconstruction, or maintenance of structures for impounding water, owners of such structures are requested to fill out as completely as possible this report form for each such dam or reservoir owned within the State of New York for which no plans or reports relative thereto are on file in this Department, and to return this report form, together with prints or photographs explanatory thereof to this department.

1. The structure is on Pump Line flowing into Filter Plant in the
City of Cohoes N.Y. County of Albany and Borders
Main line of West St. Ft. East of West City line
(Give exact distance and direction from a well-known bridge, dam, village main cross-roads or mouth of a stream)
2. Is any part of the structure built upon or does its pond flood any State lands? No
3. The name and address of the owner is City of Cohoes N.Y.
4. The structure is used for Storage of City water Before Treatment
5. The material of the right bank, in the direction with the current, is _____; at the spillway crest elevation this material has a top slope of 0 inches vertical to a foot horizontal on the center line of the structure, a vertical thickness at this elevation of 10 feet, and the top surface extends for a vertical height of 2 feet above the spillway crest.
6. The material of the left bank is Clay and Gravel; has a top slope of 2 inches to a foot horizontal, a thickness of 20 feet and a height of 10 feet.
7. The natural material of the bed on which the structure rests is (clay, sand, gravel, boulders, granite, shale, slate, limestone, etc.) Clay
8. State the character of the bed and the banks in respect to the hardness, perviousness, water bearing, effect of exposure to air and to water, uniformity, etc. Banks and Bed are impervious to a high degree being of clay soil. Banks are seeded on exterior and Ripraped on inside

9. If the bed is in layers, are the layers horizontal or inclined? *Not in Layers* If inclined what is the direction of the horizontal outcropping relative to the axis of the main structure and the inclination and direction of the layers in a plane perpendicular to the horizontal outcropping?

10. What is the thickness of the layers?

11. Are there any porous seams or fissures? *Yes*

12. The watershed at the above structure and draining into the pond formed thereby is.....square miles.

13. The pond area at the spillway crest elevation is.....acres and the pond impounds.....cubic feet of water.

14. The maximum known flow of the stream at the structure was.....cubic feet per second on

15. Has the spillway capacity ever been exceeded by a high flow?

Can any possible flood flow from the pond otherwise than through the wastes noted under 17 and 18 of this report? *No* If so, give the location, the length and the elevation relative to the spillway crest and the character and slopes of the ground of such possible wastes

16. State if any damage to life or to any buildings, roads or other property could be caused by any possible failure of the above structure. Describe the location, the character and the use of buildings below the structure which might be damaged by any failure of the structure; of roads adjacent to or crossing the stream below the structure, giving the lowest elevation of the roadway above the stream bed and giving the shape, the height and the width of stream openings; and of any embankments or steep slopes that any flood could pass over. Also indicate the character and use made of the ground below the structure.

Structure is a reservoir fed only from pump line. Reservoir is higher than the adjoining buildings. No damage could result from any except a sudden complete failure of one of the banks.

17. WASTES. The spillway of the above structure is *Nine* feet long in the clear; the waters are held at the right end by a..... the top of which is..... feet above the spillway crest, and has a top width of..... feet; and at the left end by a....., the top of which is..... feet above the spillway crest, and has a top width of..... feet.

18. There is also for flood discharge a pipe.....*20"* inches inside diameter and the bottom is..... feet below the spillway crest; and a (sluice, gate outlet)..... feet wide in the clear by..... feet high, and the bottom is..... feet below the spillway crest. *Connects with city sewer system.*

END

DATE
FILMED

11-81

DTIC